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(Serial No. 11/330,090)

IN THE
United States Court of Appeals
FOR THE FEDERAL CIRCUIT

IN RE JONATHAN R. ADAMS, ROBERT W. ADAMS

*Appeal from the United States Patent and Trademark Office
Patent Trial and Appeal Board.*

Second Corrected Brief for Appellants
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Certificate of interest

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2. The names of the real parties in interest represented by me are Jonathan R. Adams and Robert W. Adams
3. All parent corporations or any publicly held companies that own 10 percent or more of the stock of the parties or amicus curiae represented by me are: None
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Statement of Related Cases

No other appeal in or from the same proceeding was previously before this Court or any other appellate court, whether under the same or a similar title, and there are no related cases pending before this Court or any other court.

Statement of Jurisdiction

- A. The statutory basis for jurisdiction of the U.S. Patent and Trademark Office Patent Trial and Appeal Board ("Board") is 35 U.S.C. §§ 6 and 134.
- B. The statutory basis for jurisdiction of this Court is 35 U.S.C. §§ 141 and 142.
- C. Appellants filed a timely Notice of Appeal on November 1, 2013 from the Board's final and appealable Decision on Appeal issued October 2, 2013 ("the 2013 Decision"). A-372 to A-373.

I. Statement of the issues

1. Did the October 2, 2013 Decision (A-1 to A-11) improperly conclude that Claims 1-8 are obvious where the record establishes that no reference teaches or suggests the use of a lacrosse shaft made from a composite mixture comprising a combination of at least carbon fiber and titanium?

2. With respect to Claims 1-8, does the evidence of record support the 2013 Decision's holding that it would have been obvious to one of ordinary skill in the lacrosse art to modify the graphite-containing plastic lacrosse shaft of Lewis to include titanium and carbon fibers as shown in the tennis racquet of Umlauf when (i) Lewis teaches away from the use of metal materials in his lacrosse stick and (ii)

the record overwhelmingly establishes that lacrosse sticks and tennis racquets have such vastly different functions and uses so that a person of ordinary skill in the lacrosse art would not look to the teaching of Umlauft?

3. With respect to Claims 3-4 and 7-8 which are directed to particular composition ranges, did the 2013 Decision legally err in relying upon *In re Aller*, 220 F.2d 454 (CCPA 1995), to hold that "it would have been obvious for one of ordinary skill in the art to optimize a composition" when, to the contrary, the 3 to 30% graphite disclosure in Lewis (with an expressly stated "preferred range" of 9 to 16%) teaches away from the "about 40% or more" carbon fiber composition of Appellants' invention?

II. Statement of the case

A. Overview, background and claims of the invention

Appellants filed the present patent application on January 12, 2006. A-13. It is a divisional of an earlier application that was filed on April 16, 2004. A-15.

In general, Appellants' application describes the structure and composite mixture of materials to be used for the shaft portion of lacrosse sticks. A-14 to A-27. More specifically, Claims 1-8 are directed to "a composite mixture of materials comprising at least the combination of titanium and carbon fiber." A-60 to A-67, especially A-62 to A-63.

Dependent Claims 3-4 and 7-8 set forth specific amounts of the carbon fiber and titanium materials. In particular, Claims 3 and 7 indicate that "the carbon fiber is about 40% or more of the [composite] mixture." *Id.* Claims 7 and 8 are dependent, respectively on Claims 3 and 4. Claims 4 and 8 indicate that "the titanium is about 25% or less of the [composite] mixture." *Id.*

Dependent Claims 2 and 5-6 identify other features (reinforcement structure and multiple shaft portions) that are not pertinent to the patentability of Claims 1-8. Appellants admit that these features are disclosed in the prior art. Nevertheless, those claims are asserted to be patentable because they depend upon Claim 1. See, e.g., A-10 to A-11.

Thus, the broad question on appeal is whether Claim 1 is patentable. If it is, then all claims are patentable and the 2013 Decision must be reversed *in toto*.

A narrower question on appeal involves the specific material ranges set forth in dependent Claims 3-4 and 7-8. If those specific material ranges are patentable, then the 2013 Decision must be reversed in that respect.

The general nature of the lacrosse stick is shown in Figures 1-5. A-22 to A-24. A detailed explanation of a composite mixture of titanium and carbon fiber materials of the lacrosse stick shaft is set forth in the specification. A-14 to A-27, especially A-17 to A-18 relating to paragraphs [0017] and [0018]. The

specification describes specific material combinations in creating lacrosse stick shafts using certain composition mixtures.¹ *Id.*

Independent Claim 1 is directed to a lacrosse stick (see, *e.g.*, lacrosse stick 14 shown in Figure 1) having at least one shaft portion (see, *e.g.*, shaft portion 14 of lacrosse stick 10 shown in Figure 1) made from a composite mixture of materials comprising at least the combination of titanium and carbon fiber materials (see, *e.g.*, paragraph 0018). *Id.*

Dependent Claims 3 and 7 are directed to the specific minimum amount of carbon fiber in the shaft portion(s) – *i.e.*, about 40% or more of the composite mixture. These claimed amounts are expressly disclosed in the specification. See, *e.g.*, paragraph 0018. *Id.*

Similarly, other dependent claims (Claims 4 and 8) are directed to shafts having at least about 40% or more of carbon fiber materials and, in addition, a specific maximum amount of titanium in the range of at least some titanium but no more than about 25% of the mixture. These claimed amounts of titanium are also expressly disclosed in the specification. *Id.*

¹ Although the 2013 Decision does not contain a description of Appellants' invention, that description is provided in a prior January 5, 2009 Decision of the Board ("the 2009 Decision") that reversed the Examiner's original rejection. A-125 to A-135, especially A-127-128 and A-134. The 2009 Decision will be discussed in more detail, *infra*.

B. The first USPTO appeal

Over the past 8 years, Claims 1-8 have resulted in a total of three appeals to the Board. Each of those three appeals involved a different set of prior art asserted by the Examiner. As shown by a brief recitation of the 8 year prosecution history of this divisional application, the three appeals appear to establish the never-ending intransigence of the Examiner to allow Claims 1-8.

The first appeal arose from a Notice of Appeal filed on April 6, 2007. A-79. This first appeal resulted in the 2009 Decision that considered the McNeil prior art. A-126 to A-135. The 2009 Decision reversed the Examiner's rejection of Claims 1-8. *Id.* Among other things, the 2009 Decision held:

We find that Appellants have the better argument. The Specification teaches that carbon fibers and/or titanium are added to alloy materials and thus, we interpret "a composite mixture of materials comprising at least the combination of titanium and carbon fiber" as a single mixture of the components, and not strips of carbon fiber being inlaid into a metal shaft. **** Moreover, the claim recites a "lacrosse stick" which we interpret as giving life and providing structure to the claim, and the Examiner has provided no evidence or scientific reasoning as to why one would adapt the shaft of a golf club to that of a lacrosse stick.

A-134.

C. The second USPTO appeal

In view of the Board's 2009 Decision, Appellants' application was returned to the Examiner. However, no patent issued. Instead, the Examiner conducted a new second search and, once again, he rejected Claims 1-8 based upon different prior art (at total of 5 new patents).

In response, Appellants filed a Notice of Appeal on December 22, 2009. A-194. Thereafter, Appellants filed a timely Appeal Brief. A-195 to A-221.

The Examiner did not file an Examiner's Answer. Instead, he issued a new Official Action based upon a third prior art search identifying 6 new references. A-13. In other words, although Appellants technically "prevailed" on the Second Appeal, no patent issued for Claims 1-8.

D. The third USPTO appeal

As noted just above, the Examiner rejected Claims 1-8 in view of 6 new references located during his third search of the prior art. Appellants filed a timely Notice of Appeal. A-256.

In the 2013 Decision, the Board affirmed the rejection of Claims 1-4 based upon Lewis in view of Umlauft. A-1 to A-11 and A-274 to A-391. The Board also relied upon Morrow with respect to Claims 5-8 because it shows a lacrosse stick having two shaft portions. A-9 and A-392 to A-399.

Appellants are not relying upon "the at least two shafts portion" language that appears in Claim 5 and in the claims dependent upon it (Claims 6-8) for patentability. A-360 to A-367, especially A-362, n. 2. Thus, allowance of Claims 5-8 is dependent upon Claims 1 or 3-4, as indicated by the Board. A-10.

In other words, the focus of the appeal to the Board (and here) is an evaluation of just the Lewis and Umlauf references.² In that regard, the Board found that Lewis discloses "a graphite-loaded plastic handle" for a lacrosse stick. A-5. The Board did not identify any teaching in Lewis of the use of carbon fiber.

Further, the Board rejected the Appellants' argument that the disclosure of the "graphite-loaded plastic handle" in Lewis teaches away from the requirement in Claims 1-8 that a shaft must be "made from a composite mixture of materials comprising at least the combination of titanium and carbon fiber." A-8. In doing so, the 2013 Decision ignored the express teaching in Lewis that the use of metal lacrosse handles initially "were unsuccessful due to inadequate strength or in that they were too heavy and/or they did not have the desired player feel." A-395, at Col. 1, ll. 25-40. Thus, Lewis expressly stated that "[a]n object of the present invention is to provide a lacrosse stick having a graphite-loaded plastic handle overcoming the disadvantages of prior art handles." *Id.*, at Col. 1, ll.43-45.

Accordingly, Appellants assert that a person of ordinary skill in the lacrosse art would not read Lewis as suggesting the use of metal materials in the handle. To the contrary, that person would read Lewis as discouraging the use of metal.

² The Board expressly found that the rejections based upon Harrigan, Feeney and Dohnomoto were cumulative and, for that reason, the rejections based upon that art were vacated. A-3 to A-4. Nevertheless, a short discussion of these three references appears near the end of this brief.

Indeed, Lewis' does not permit the use of any metal materials and, for that reason, it expressly teaches away from combining that patent with other "metal" prior art. More specifically, Lewis teaches that the handles are only made from plastic and graphite. A-373 (Abstract) and A-378 (Claim 1 and, therefore, all other claims). See, also, A-377, at col. 4, ll. 42-58.

The 2013 Decision relies upon the combination of Lewis and Umlauft. A-8. However, Umlauft does not contain any teaching with respect to a lacrosse stick shaft. A-371 to A-391.

Instead, Umlauft relates only to a tennis racquet. *Id.* In particular, the Board found that Umlauft discloses a tennis racquet frame that "is formed from a composite material including carbon fibers, titanium fibers, and epoxy resin." A-6.

Appellants argued that one of ordinary skill in the art of lacrosse sticks would not look to a tennis racquet reference because the two products have distinctly different functions and uses. A-360 to A-367, especially A-362 to A-363. In that regard, the uses and functions of a tennis racquet are different from those of a lacrosse stick for at least six reasons: (i) a tennis racquet is not intended to be used in contact with other tennis racquets during play whereas a lacrosse stick is intended to be used in vigorous, violent contact with other lacrosse sticks, (ii) a tennis racquet is not intended to be used to hit other players whereas a

lacrosse stick is intended to be used to aggressively "hit" other players, (iii) a tennis racket is not intended to be used during play to make repeated, direct contacts with the ground whereas a large part of playing lacrosse involves the use of the stick in contact with the ground (such as face-off and ground ball activities), (iv) a tennis racquet is not intended to be used for "catch, cradle and pass" functions whereas these are essential functions for lacrosse sticks, (v) a tennis racquet is typically (but not always) used via a "one handed" playing grip whereas a lacrosse stick is not typically used with just one hand, and (vi) a tennis racquet has a short length whereas a sport lacrosse stick has a longer length – indeed, a defense stick can be many times the length of a tennis racquet. *Id.* In other words, tennis racquets and lacrosse sticks fall into distinctly different fields of sport and have fundamentally different uses and functions. Accordingly, Appellants argued that a person of ordinary skill in the art relating to lacrosse sticks would not look to the very different field of tennis racquets. *Id.*

The 2013 Decision did not explicitly address these arguments. Instead, it relied upon *In re Clay*, 966 F.3d 656 (Fed. Cir. 1992) for the proposition that "a reference is reasonably pertinent if it logically would have commended itself to an inventor's attention." A-9. As will be discussed *infra*, the 2013 Decision was decided before this Court's decision in *In re Giannelli*, No. 2013-1167 (Fed. Cir.,

decided January 13, 2014), which concluded that using the teaching of a chest press machine to modify a rowing machine is not obvious (at 9).

Moreover, the Umlauft patent emphasizes that it only relates to tennis racquets. A-379 to A-391, especially A-387 (where the field of invention specifically states that "[t]his invention relates to tennis racquets, and more particularly to lightweight tennis racquets having high frequency," at col. 1, ll. 12-14) and A-389 to A-391 (wherein every claim is expressly limited to a tennis racquet). Thus, there is no indication in Umlauft to one of ordinary skill in the lacrosse art that the tennis racquet invention in that patent has any relevance outside of that particular sporting product.

Turning to Claims 3-4 and 7-8, those claims contain specific recitations with respect to the composite material ranges for carbon fiber and titanium. A-62 to A-63. Claims 3 and 7 indicate that "carbon fiber is about 40% or more of the [composite] mixture." *Id.* Claims 4 and 8 add the further limitation that "titanium is about 25% or less of the composite mixture."

The 2013 Decision held that "[t]he combination of Lewis and Umlauft disclose the general conditions and requirements for a lacrosse stick made from

plastic and comprising a combination of titanium and carbon fiber."³ A-9. Then, relying upon *In re Aller*, the Board concluded that "it would have been obvious for one of ordinary skill in the art to optimize a composition to form a lacrosse stick shaft according to the particular requirements for any particular lacrosse stick." A-9 to A-10.

The 2013 Decision rejected Appellants' argument that neither Lewis nor Umlauft disclose the composition ranges of Claims 3-4 and 7-8. A-10. It also *sub silencio* rejected Appellants' argument that there is no overlap in the % ranges in the prior art and in those claims. A-257 to A-273, especially A-269.

However, once again, the only lacrosse reference (Lewis) teaches away from the requirement in Claims 3-4 and 7-8 that that "carbon fiber is about 40% or more of the [composite] mixture." For example, the Abstract in Lewis discloses that "[t]he handle is preferably comprised of 80 to 95 percent plastic and 5 to 20% graphite." A-374. See, also, A-376, col. 2, ll. 3-6 ("The objects of the present invention are accomplished by providing a polygonal or tubular plastic lacrosse stick handle which is loaded with 5 to 20% graphite during fabrication.")

³ This statement appears to confirm that the Board recognized that Lewis teaches a graphite-loaded plastic handle and not a carbon fiber material. Thus, the 2013 Decision's statement that "it would have been obvious to add Umlauft's titanium fibers to the plastic handle composite material of Lewis" is somewhat curious because it ignores the carbon fiber requirement of Claims 1-8.

Indeed, the broadest disclosure in Lewis with respect to graphite teaches away from Applicants' "at least about 40% or more" of carbon fiber by the disclosure to one of ordinary skill in the art that:

"While graphite loading in the range of 3 to 30 percent provides for a superior plastic handle, it has been found that 9 to 16 percent is the preferred range."

A-377, at col. 4, ll. 46-49.

Moreover, the decision cited by the Board (*In re Aller*) does not apply to the situation where, as here, the general conditions of the claim are not described in the prior art. See, e.g., *In re Antoine*, 599 F.2d 618, 620 (CCPA 1977).

In summary, the current procedural posture of this case is that Claims 1-8 stand rejected and they are the subject of this appeal.

IV. Summary of the argument

Lewis and Umlauft teach away from the claim 1 requirement for a composite mixture containing carbon fibers and titanium for a lacrosse shaft. In addition, Umlauft is directed to a non-relevant art. Therefore, it is not a proper reference. Finally, none of the % ranges in claims 3-4 or 7-8 are disclosed in the cited prior art.

V. Argument

A. Standard of review

The Board's legal conclusions are reviewed *de novo*. *In re Elsner*, 381 F.3d 1125, 1127 (Fed. Cir. 2004). In that regard, obviousness is a question of law based upon factual findings. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966); and *Elsner*, 381 F.3d at 1127.

As a result, the Board's factual findings that allegedly support its legal conclusions are reviewed under the "substantial evidence" test. *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). This includes the Board's factual findings with respect to the interpretation of the prior art and whether one of ordinary skill in the lacrosse art would be motivated to modify or adopt non-lacrosse prior art.

The legal test for obviousness is that a claim is invalid where, the differences between the subject matter sought to be protected and the prior art are such that the subject matter would have been obvious to one of ordinary skill in the relevant art at the time of the invention. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406-07 (2007); and 35 U.S.C. § 103(a). The USPTO has the initial burden of proving a *prima facie* case of obviousness and the burden shifts only after a *prima facie* case is established. *In re Giannelli*, at 7.

B. No cited prior art suggests carbon fibers and titanium

Significantly, the Examiner expressly admitted that Lewis "fails to clearly disclose the use of a composite mixture of titanium and carbon." A-243 to A-247, especially A-245. This point is important because, even after three searches, the Examiner still could not find a lacrosse shaft reference that contains the claimed composite mixture of titanium and carbon fibers.

Instead, the Examiner and the Board relied upon a non-lacrosse shaft reference to make the obviousness objection.

C. Lewis and Umlauft cannot be properly combined

As pointed out previously, the Board did not identify any teaching in Lewis of the use of carbon fiber. By law, a prior art reference must be considered for all that it teaches and does not teach. *E.g., W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

Nevertheless, the Board rejected the Appellants' argument that the disclosure of the "graphite-loaded plastic handle" in Lewis teaches away from the requirement in Claims 1-8 that a shaft must be "made from a composite mixture of materials comprising at least the combination of titanium and carbon fiber." A-8. However, Lewis plainly teaches away from the use of any metal materials in the invention. For example, Lewis disparages the use of metal lacrosse handles

because they initially "were unsuccessful due to inadequate strength or in that they were too heavy and/or they did not have the desired player feel." A-395, at Col. 1, ll. 25-40. Therefore, Lewis teaches away from using metal containing handles and one of ordinary skill in the lacrosse art therefore would not have used a metal to modify the plastic handle of Lewis. This is especially true in view of the advantages Lewis expressly ascribes to the graphite-loaded plastic handle:

The graphite-loaded plastic handle provides improved handling characteristics which is an important feature of a lacrosse stick. Thus, the handle has the requisite player feel which, although an intangible characteristic, is of real and critical importance in the fabrication and manufacture of a lacrosse stick. Moreover, the [plastic] handle of the invention provides the essential balance between weight distribution, physical properties, control under all conditions, and the desired feel in the hands of a player.

A-395, at col. 2, ll. 6-15 (emphasis added).

In short, Lewis expressly stated that "[a]n object of the present invention is to provide a lacrosse stick having a graphite-loaded plastic handle overcoming the disadvantages of prior art handles." *Id.*, at Col. 1, ll.43-45. As Lewis teaches, those disadvantages include the inadequate strength, the heavy weight and the poor player feel of metal handles.

More to the point, Lewis' does not permit the use of any metal materials because Lewis specifically teaches that the handles are only made from plastic and graphite. A-373 (Abstract) and A-378 (Claim 1 and, therefore, all other claims).

See, also, A-377, at col. 4, ll. 42-58. In other words, Lewis both disparages the use of metal in lacrosse handles and it excludes metal from the plastic lacrosse stick invention.

Under these circumstances, Lewis clearly teaches away from Appellants' Claims 1-8. Therefore, an obviousness rejection is not proper. See, *e.g.*, *United States v. Adams*, 383 U.S. 39, 51-52 (1966). Likewise, it is not enough to demonstrate that all of the elements of a claim exist somewhere in the prior art because most inventions rely upon building blocks long since uncovered, and it is necessary to find a reason to combine those elements.

As a result, this Court has often held that a reference teaches away from an invention when either (a) a person of ordinary skill in the art would be discouraged to modify the prior art based upon its teachings or (b) a person of ordinary skill in the art would rely upon the prior art to adopt a path different from the claimed invention. See, *e.g.*, *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); and *McGinley v. Franklin Sports Inc.*, 262 F.3d 1339, 1354 (Fed. Cir. 2001). Here, Lewis teaches away for both reasons.

In addition, Umlauft also is deficient because it does not contain any teaching with respect to a lacrosse stick shaft. A-371 to A-391. Instead, Umlauft relates only to a tennis racquet. *Id.*

The present record demonstrates that one of ordinary skill in the art of lacrosse sticks would not look to a tennis racquet reference because the two products have distinctly different functions and uses. A-360 to A-367, especially A-362 to A-363. As explained above, the uses and functions of a tennis racquet are different from those of a lacrosse stick for at least six reasons: (i) a tennis racquet is not intended to be used in contact with other tennis racquets during play whereas a lacrosse stick is intended to be used in vigorous, violent contact with other lacrosse sticks, (ii) a tennis racquet is not intended to be used to hit other players whereas a lacrosse stick is intended to be used to aggressively "hit" other players, (iii) a tennis racket is not intended to be used during play to make repeated, direct contacts with the ground whereas a large part of playing lacrosse involves the use of the stick in contact with the ground (such as face-off and ground ball activities), (iv) a tennis racquet is not intended to be used for "catch, cradle and pass" functions whereas these are essential functions for lacrosse sticks, (v) a tennis racquet is typically (but not always) used via a "one handed" playing grip whereas a lacrosse stick is not typically used with just one hand, and (vi) a tennis racquet has a short length whereas a sport lacrosse stick has a longer length – indeed, a defense stick can be many times the length of a tennis racquet. *Id.* In other words, tennis racquets and lacrosse sticks fall into distinctly different fields of sport and have fundamentally different use and functions.

The 2013 Decision did not explicitly address (let alone rebut) these arguments with respect to how a person of ordinary skill in the lacrosse art would view (or not view) Umlauft. Instead, it relied upon *In re Clay*, for the general rule that "a reference is reasonably pertinent if it logically would have commended itself to an inventor's attention." A-9. However, obviousness cannot be sustained on conclusory statements that ignore marketplace reality with respect to the function and uses of the prior art when compared with the claimed invention. See, e.g., *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

Moreover, *In re Clay* holds that if the prior art "is directed to a different purpose" than the claimed invention, then a person of ordinary skill in the art "would accordingly have had less motivation or occasion to consider it. 966 F.3d at 659. Thus, *In re Clay* held that the prior art did not render obvious the claimed invention. *Id.*, at 660.

Furthermore, the 2013 Decision was decided before this Court's very recent decision in *In re Giannelli*, which concluded that using the teaching of a chest press machine to modify a rowing machine is not obvious. The *Giannelli* decision is important because the Umlauft patent emphasizes that it only relates to tennis racquets. A-379 to A-391, especially A-387 (where the field of invention specifically states that "[t]his invention relates to tennis racquets, and more

particularly to lightweight tennis racquets having high frequency," at col. 1, ll. 12-14) and A-389 to A-391 (wherein every claim is expressly limited to a tennis racquet). Thus, there is no indication or suggestion in Umlauft to one of ordinary skill in the lacrosse art that it has any relevance beyond tennis racquets.

Giannelli also held that "[p]hysical capability alone does not render obvious that which is contraindicated." *Giannelli*, at 9. Here, Lewis and Umlauft (both alone and together) do not render Claims 1-8 obvious because they teach away from those Claims and, further, they cannot properly be combined together.

Indeed, *Gianelli* concluded that a "chest press machine is not a rowing machine, nor has evidence been shown that it is." *Id.* As this Court wryly pointed out, "anyone who has used exercise machines knows that a sure-fire way to cause injury is to use a machine in a manner not intended by the manufacturer." *Id.*

Here, the record demonstrates that a lacrosse stick and a tennis racquet have very different functions and uses. No one would ever use either product to play the other sport. Indeed, no one who ever played lacrosse would reasonably suggest that a tennis racquet was "made to," "designed to" or "configured to" be used to play lacrosse. *Id.*, at 8.

Consequently, the rejection of Claims 1-8 should be reversed.

D. The Lewis % ranges teach away from claims 3-4 and 7-8

Turning to Claims 3-4 and 7-8, those claims contain specific recitations with respect to the composite material ranges for carbon fiber and titanium. A-62 to A-63. Claims 3 and 7 indicate that "carbon fiber is about 40% or more of the [composite] mixture." *Id.* Claims 4 and 8 add the further limitation that "titanium is about 25% or less of the composite mixture."

The 2013 Decision asserts that "it would have been obvious for one of ordinary skill in the art to optimize a composition to form a lacrosse stick shaft according to the particular requirements for any particular lacrosse stick." A-9 to A-10. However, Lewis teaches away from the requirement in Claims 3-4 and 7-8 that "carbon fiber is about 40% or more of the [composite] mixture." For example, the Abstract in Lewis discloses that "[t]he handle is preferably comprised of 80 to 95 percent plastic and 5 to 20% graphite."⁴ A-374. See, also, A-376, col. 2, ll. 3-6 ("The objects of the present invention are accomplished by providing a polygonal or tubular plastic lacrosse stick handle which is loaded with 5 to 20% graphite during fabrication.")

⁴ Lewis' disclosure of graphite does not teach the use of carbon fibers.

Indeed, the broadest disclosure in Lewis with respect to graphite teaches away from Applicants' "at least about 40% or more" of carbon fiber. Specifically, Lewis instructs one of ordinary skill in the lacrosse art that:

"While graphite loading in the range of 3 to 30 percent provides for a superior plastic handle, it has been found that 9 to 16 percent is the preferred range."

A-377, at col. 4, ll. 46-49.

Significantly, the decision cited by the Board (*In re Aller*) involved prior art having just one example that did not indicate any "preferred range." *In re Aller*, 220 F.2d at 455. Thus, the *Aller* prior art disclosed the "general conditions of the claim."⁵ *Id.*, at 456.

Here, however, the general conditions of the Claims 3-4 and 7-8 are not described in the prior art. For that reason, those claims are patentable. See, *e.g.*, *In re Antoine*, 599 F.2d at 620, which held that *Aller* was not applicable where the parameter that was allegedly optimized would not have been recognized as being "result-effective" from reading the prior art disclosure.

Put in different terms, Lewis does not disclose that "carbon fiber is about 40% or more of the [composite] mixture" (Claims 3-4) or that "titanium is about 25% or less of the composite mixture" (Claims 7-8). To the contrary, Lewis either

⁵ Similarly, Lewis does not disclose ranges that overlap with Appellants' invention as was the case in *In re Peterson*, 315 F.3d 1325 (Fed. Cir. 2003).

expressly teaches away from those ranges or suggests "outer limits" that do not overlap with Claims 3-4 and 7-8. Consequently, Appellants' ranges are not obvious. See, *e.g.*, *In re Sebek*, 465 F.2d 904, 906-07 (CCPA 1972); and *In re Yates*, 663 F.2d 1054, 1056-57 (CCPA 1981).

In summary, Lewis and Umlauf do not teach or suggest the claimed subject matter % ranges. Instead, the only teaching of the claimed % ranges comes from Appellants' own disclosure. But "[t]he inventor's own path itself never leads to a conclusion of obviousness; that is hindsight." *Otsuka Pharm. Co. v. Sandoz, Inc.*, 678 F.3d 1280, 1296 (Fed. Cir.2012).

E. Other prior art

None of the other 3 prior art references cited by the Examiner are relevant to this appeal.

Harrigan does not relate to lacrosse sticks but, rather, involves composites used in weight critical structures such as airframes and space vehicles. A-440 to A-402, especially A-401 at col. 1, ll. 4-13. Simply stated, it is inconceivable that a person of ordinary skill in the lacrosse art would consider prior art in the airframe and space vehicle field.

Although Feeney relates to a lacrosse stick, the invention in that patent is directed to the head **30** of the lacrosse stick. A-403 to A-411, especially A-408 at

col. 1, ll. 4-7 and A-411 at col. 6, ll. 1-26. Feeney does not suggest or disclose a lacrosse shaft/handle that contains "a composite mixture of materials comprising at least the combination of titanium and carbon fiber" as set forth in Claims 1-8 or the carbon fiber and/or titanium ranges of Claims 3-4 and 7-8.

Finally, Dohnomoto does not mention or suggest lacrosse usage. Instead, it appears to relate to automotive products because the assignee is Toyota. Again, Applicants respectfully submit that a person of ordinary skill in the lacrosse art would not consider either prior art in the automotive products field or Dohnomoto when creating an invention.

VI. Conclusion and statement of relief sought

For the reasons discussed above, it is respectfully submitted that the Board's 2013 Decision is legally erroneous and, for that reason, it should be reversed. In addition, bearing in mind the extremely long 8 year pendency of Appellants' divisional application, Appellants respectfully request that the USPTO be ordered to issue a patent for Claims 1-8 so as to deny the Examiner yet a fourth opportunity to reject those claims. Eight years, three prior art searches and three appeals to the Board should be sufficient to determine patentability.

February 18, 2014

Respectfully submitted,

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Addendum

Decision on Appeal, October 2, 2013..... A-1



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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JONATHAN R. ADAMS and ROBERT W. ADAMS

Appeal 2012-001751
Application 11/330,090
Technology Center 3700

Before TONI R. SCHEINER, LORA M. GREEN, and
FRANCISCO C. PRATS, *Administrative Patent Judges*.

GREEN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal¹ under 35 U.S.C. § 134 from the Examiner's rejection of claims 1-8.² We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ The Real Parties in Interest are Jonathan R Adams and Robert W. Adams (Appeal Br. 3).

² Claims 9-16 are also pending, but stand withdrawn from consideration (App. Br. 5).

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STATEMENT OF THE CASE

The Specification discloses “an extendable lacrosse stick . . . [having a] shaft . . . [that] contains two or more telescopic shaft sections . . . which can slide relative to each other so that the stick length can be modified” (Spec. 3, ¶ 0016). The Specification discloses that the “telescopic shafts may be reinforced by . . . material selection []such as titanium, carbon fiber or other composition mixtures” (*id.* at ¶ 0017).

Claim 1, the only independent claim, reads as follows:

1. A lacrosse stick having at least one shaft portion made from a composite mixture of materials comprising at least the combination of titanium and carbon fiber.

The claims stand rejected under 35 U.S.C. § 103(a) as follows:

- I. Claims 1-4 in view of Lewis³ and Umlauft⁴ (Ans. 5);
- II. Claims 5-8 in view of Lewis, Umlauft and Morrow⁵ (Ans. 6);
- III. Claims 1-4 in view of Lewis and Harrigan⁶ (Ans. 7)
- IV. Claims 5-8 in view of Lewis, Harrigan and Morrow (Ans. 8);
- V. Claims 1-4 in view of Feeney⁷ and Dohnomoto⁸ (Ans. 9); and
- VI. Claims 5-8 in view of Feeney, Dohnomoto and Morrow (Ans. 10).

³ Lewis, Jr. US 4,739,994, Apr. 26, 1988.

⁴ Umlauft et al., US 6,106,417, Aug. 22, 2000.

⁵ Morrow et al., US 2005/0079935 A1, Apr. 14, 2005.

⁶ Harrigan, Jr. et al., US 4,223,075, Sept. 16, 1980.

⁷ Feeney, US 5,685,791, Nov. 11, 1997.

⁸ Dohnomoto et al., US 4,600,661, Jul. 15, 1986.

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Rejections III to VI are cumulative to rejections I and II. Therefore, we vacate rejections III to VI in favor of rejections I and II, which rejections address all the claims on appeal. We affirm the rejection of claims 1-4 over the combination of Lewis and Umlauf and the rejection of claims 5-8 over the combination of Lewis, Umlauf and Morrow.

Issue

The Examiner has rejected claims 1-4 under 35 U.S.C. § 103(a) as obvious in view of Lewis and Umlauf. The Examiner has also rejected claims 4-8 under 35 U.S.C. § 103(a) as obvious in view of Lewis, Umlauf and Morrow. We consider these rejections together.

The Examiner finds that “Lewis discloses the elements of claim 1 ... [but] fails to clearly disclose the use of a composite mixture of titanium and carbon” (Ans. 5). The Examiner finds that “Umlauf discloses the use of a composite mixture of titanium and carbon fibers” (*id.*). The Examiner concludes that it “would have been obvious to one of ordinary skill in the art ... to have employed the composite mixture of titanium and carbon fibers of Umlauf with the apparatus [of Lewis] in order to provide a stronger non-linear improvement in strength to the device for play” (*id.* at 5-6).

Appellants contend that Lewis describes “a plastic handle as an improvement to prior art handles, including those made of metal ... [and] teaches away from using metal handles” (Appeal Br. 11-12 (emphasis removed)). Appellants argue that “one of ordinary skill in the art ... would not have used a composition including metal to modify the plastic handle of Lewis,” especially in view of the advantages Lewis discloses for graphite-loaded plastic handles (*id.* at 12).

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The issue presented is: Does the evidence of record support the Examiner's conclusion that one of skill in the art would have been motivated to modify the graphite-containing plastic lacrosse stick shaft to contain titanium as disclosed in Umlauf?

Findings of Fact

FF1. Lewis discloses "a lacrosse stick including a graphite-loaded plastic handle which is formed to provide advantages as to grip, strength, safety, weight distribution, and comfortable feel in the hands of a player" (Lewis, col. 1, ll. 6-9).

FF2. Lewis discloses that the graphite-loaded plastic handle has advantages "with respect to standardization, desirable weight distribution with the stick head, strength and avoidance of fracturing, and having improved grip and feel under virtually all conditions" (*id.* at col. 1, ll. 44-49).

FF3. Lewis discloses that "lacrosse sticks used by defense players may suffer more frequent and sometimes more severe shocks, as by impact, than the attack and midfield sticks. Factors of lightness, limited flexibility and strength contribute to the suitability for use by attack and midfield players" (*id.* at col. 3, ll. 57-62).

FF4. Lewis discloses that "[p]referred plastic materials ... are thermoplastic polyesters, polycarbonates, and nylon, and blends of these polymers" (*id.* at col. 4, ll. 14-17).

FF5. Lewis discloses that "an extremely superior lacrosse stick handle may be fabricated by using 3 to 30 percent graphite in conjunction

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with the above-referenced plastics. The graphite is uniformly dispersed in the plastic prior to molding the handle” (*id.* at col. 4, ll. 42-46).

FF6. Umlauft discloses a “lightweight, high stiffness tennis racket . . . [which] is formed from a composite material including carbon fibers, titanium fibers, and epoxy resin” (Umlauft, abstract).

FF7. Umlauft discloses that the tennis racket frame is “manufactured of a synthetic composite reinforced with carbon fibers forming a racket prepreg . . . [which] is obtained by layering the carbon composite at several different angles and forming the layers into the desired hollow frame shape” (*id.* at col. 3, ll. 39-43).

FF8. Umlauft discloses that to “further achieve the lightweight, high strength properties, the carbon reinforced synthetic composite is strengthened in the racket throat area **16** with titanium fibers” (*id.* at col. 3, ll. 52-54).

FF9. Umlauft discloses that “titanium fibers **26** may be included at any or all locations about tennis racket frame **12** Including titanium fibers **26** at throat area **16** helps to relieve high torsional stresses that occur at the junction between the racket head **14** and handle” (*id.* at col. 3, ll. 59-64).

FF10. Umlauft discloses that the “added strength resulting from the utilization of titanium fibers **26** allows less material to be used, which results in a correspondingly reduced overall weight of racket **10** without a detrimental reduction in strength. Indeed, the use of titanium fibers results in a non-linear improvement in racket strength” (*id.* at col. 3, l. 65-col. 4, l. 3).

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Principles of Law

‘A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor’s endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor’s attention in considering his problem.’ *In re Clay*, 966 F.2d 656, 659 (Fed.Cir.1992). In other words, ‘familiar items may have obvious uses beyond their primary purposes.’ *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, [402], 127 S.Ct. 1727, 1742 (2007).

In re ICON Health and Fitness, Inc., 496 F.3d 1374, 1379-80 (Fed. Cir. 2007) (a reference describing a folding bed found pertinent to Appellants' folding treadmill).

“[W]here general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456 (CCPA 1955).

Analysis

Claim 1 is directed to a lacrosse stick having at least one shaft portion made from a composite mixture of materials comprising at least the combination of titanium and carbon fiber.

Lewis discloses a lacrosse stick having a graphite-loaded plastic handle which provides advantages related to grip, strength, safety, weight distribution, and comfortable feel in the hands of a player. Lewis discloses that the graphite is uniformly dispersed in the plastic prior to molding the handle. Umlauf discloses a lightweight, high stiffness tennis racket which is formed from a composite material including carbon fibers, titanium fibers, and epoxy resin. Umlauf discloses that the added strength resulting from

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the titanium fibers allows less material to be used without a detrimental reduction in strength. In view of these disclosures, we agree with the Examiner that it would have been obvious for one of skill in the art modify the Lewis plastic composition to comprise titanium and carbon fiber, as disclosed by Umlauft, in order to obtain a stronger lacrosse stick.

Appellants argue that Lewis describes “a plastic handle as an improvement to prior art handles, including those made of metal ... [and] teaches away from using metal handles” (Appeal Br. 11-12). Appellants argue that, therefore, “one of ordinary skill in the art ... would not have used a composition including metal to modify the plastic handle of Lewis,” especially in view of the advantages Lewis discloses for graphite-loaded plastic handles (*id.* at 12).

This argument is not persuasive. As noted by the Examiner (Ans. 12), the incorporation of the titanium fibers of Umlauft in the plastic handle composite material of Lewis would not result in a metal handle, but rather a plastic handle with titanium fibers incorporated into the plastic. Since Umlauft discloses that titanium fibers provide a significant enhancement in terms of strength without adding excess weight, we agree with the Examiner that it would have been obvious to add Umlauft’s titanium fibers to the plastic handle composite material of Lewis.

Appellants also argue that “tennis racquets and lacrosse sticks fall into distinctly different fields of use and functions ... [and] a person of ordinary skill in the art relating to lacrosse sticks would not look to the very different field of tennis racquets” (Reply Br. 4).

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This argument is not persuasive. In accord with *In re Clay*, a reference is reasonably pertinent if it logically would have commended itself to an inventor's attention. Since tennis rackets and lacrosse sticks are both sports equipment, with similar concerns of strength, durability and weight, one of skill in the art would have logically looked to other sports equipment, such as the tennis racket art, to solve problems related to strength, and durability, and weight of lacrosse sticks.

Appellants also argue the rejection of claim 3. Claim 3 depends from claim 1, and further requires that the carbon fiber is about 40% or more of the mixture. Appellants argue that neither Lewis nor Umlauft "disclose or suggest the % composition of the titanium-carbon fiber mixture" (Appeal Br. 13). Appellants also argue that the Examiner provides no evidence to support the argument that it would have been obvious to the ordinary artisan to have selected an appropriate ratio in order to optimize the strength versus weight ratio of the shaft (*id.* at 13).

This argument is not persuasive. The combination of Lewis and Umlauft disclose the general conditions and requirements for a lacrosse stick made from plastic and comprising a combination of titanium and carbon fiber. Lewis also discloses that design factors for a lacrosse stick shaft composition include weight distribution with the stick head, strength, and grip and feel and whether the stick will be used by defense players, where strength is required, or by attack and midfield players, where weight is factor. In accord with *In re Aller*, it would have been obvious for one of skill in the art to optimize a composition to form a lacrosse stick shaft

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according to the particular requirements or preferences for any particular lacrosse stick.

Appellants also argue the rejection of claim 4. Claim 4 depends from claim 1 indirectly and further requires that the carbon fiber is about 40% or more of the mixture and that the titanium is about 25% or less of the mixture. Appellants argue that “[n]either Lewis nor Umlauf et al. disclose or suggest the % composition of the titanium-carbon fiber mixture” (Appeal Br. 13).

This argument is not persuasive. As discussed above, the combination of Lewis and Umlauf suggest the general conditions for a lacrosse stick shaft portion made from plastic and comprising a combination of titanium and carbon fiber. The ordinary artisan would have found it obvious to optimize the amount of titanium to provide the strength required for a particular application. We note that claim 5 is directed to a broad range of titanium, i.e. from about 25 % or less of the mixture.

The Examiner has also rejected claims 5-8 under 35 U.S.C. § 103(a) as obvious in view of Lewis, Umlauf and Morrow. Claims 5-8 depend from claim 1, directly or indirectly, and further require that the lacrosse stick has at least two shaft portions. Appellants do not dispute that the combination of Morrow with Lewis and Umlauf would have made obvious a lacrosse stick having two shaft portions (Appeal Br. 14). However, Appellants argue that Morrow does not cure the deficiencies of Lewis and Umlauf with respect to the limitation of a “shaft portion made from a composite mixture of materials comprising at least the combination of titanium and carbon fiber,” as required by claims 5-8, or with respect to the limitations of “the carbon

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fiber is about 40% of the mixture” or “the titanium is about 25% or less of the mixture,” as required by claims 7 and 8, respectively (*id.* at 14-15).

Appellants’ arguments are not persuasive because, for the reasons discussed above, we agree with the Examiner that the combination of Lewis and Umlauf would have made obvious a lacrosse stick with a shaft portion made from a composite mixture comprising titanium and carbon fiber such that the carbon fiber is about 40% of the mixture and the titanium is about 25% or less of the mixture. Thus, we affirm the rejection of claims 5-8 as being obvious in view of Lewis, Umlauf and Morrow.

Conclusion of Law

The evidence of record supports the Examiner’s conclusion that one of skill in the art would have been motivated to modify the graphite-containing plastic lacrosse stick shaft of Lewis to contain titanium as disclosed in Umlauf.

SUMMARY

We affirm the rejections of claims 1-8 under 35 U.S.C. § 103(a).

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

lp

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I, Michael E. Crawford, being duly sworn according to law and over the age of 18, upon my oath depose and state that:

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February 18, 2014

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